

ABSTRACT OF THE DISCLOSURE

A magnetoresistive element has a magnetoresistive film and a pair of electrodes adapted to flow a sense current in a direction substantially perpendicular to a plane of the magnetoresistive film. The magnetoresistive film includes first and second magnetization free layers and first to fourth magnetization pinned layers with nonmagnetic intermediate layers interposed therebetween. The second magnetization pinned layer and the third magnetization pinned layer are formed between the second nonmagnetic intermediate layer and the third nonmagnetic intermediate layer. The directions of magnetization of the first and second magnetization pinned layers are substantially parallel to each other. The directions of magnetization of the third and fourth magnetization pinned layers are substantially parallel to each other. Further, the direction of magnetization of the second magnetization pinned layer is substantially antiparallel to the direction of magnetization of the third magnetization pinned layer.